

IGY and the Dawn of the Space Age

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International cooperation has been a hallmark of geophysical research for the last 125 years. The first International Polar Year (IPY), in 1882-83, brought 11 nations together in polar science projects. The second IPY, fifty years later in 1932-33, involved some 44 nations in geophysical research projects, mostly in the Arctic.

In 1950, several distinguished scientists including Lloyd Berkner (1905 - 1967), James van Allen (1914 -2006) and Sidney Chapman (1888 - 1970) realized that technologies developed during World War II such as rockets and radar could be used in a new round of geophysical research. With the first and second IPYs in mind, Berkner proposed to the international scientific community that a third IPY take place only 25 years after the second one, with emphasis on the Antarctic which was still largely a scientific terra incognita.

Under the International Council of Scientific Unions, his proposal was expanded to include the whole world, with emphasis on the polar areas, and especially the Antarctic. The *Comité spécial de l'Année géophysique internationale* (CSAGI) was formed to coordinate the activities of the program which was renamed the International Geophysical Year (IGY). The "year" was actually 18 months long, from July 1, 1957 through December 31, 1958, and coincided with a period of maximum sunspot activity.

In addition to terrestrial geophysics and meteorology, there were studies of the upper atmosphere, the aurora, the near-space environment of the Earth and solar activity. Rockets as well as ground-based equipment were used in these studies, and for the first time artificial satellites were launched as well.

In total, some 67 nations participated in the IGY. A network of almost fifty research stations in the Antarctic and sub-Antarctic anchored the scientific activity of the IGY, and this cooperative effort in the south Polar area was later formalized with the signing of the

Antarctic Treaty in 1961. In 1964-1965, a follow-up cooperative research program, known as the International Quiet Sun Year, took place during a period of minimum solar activity.

In addition to the International Geophysical Year, the fourth IPY, began March 1, 2007, and will continue through March 1, 2009, a project "year" actually two years long. One hundred twenty-five years after the first IPY, 75 years after the second IPY, and 50 years after the IGY, the fourth IPY continues the proud tradition of cooperative scientific research in geophysics.



James van Allen (1914 -2006)
(St Vincent and Grenadines Scott 2080f)

International Polar Year 2007-2008

Continuing the tradition of international cooperation that began with the first IPY in 1882-1883, scientists from around the world will initiate a new era in polar research by participating in IPY 2007-2008. Working across many disciplines, they will conduct field observations, research, and analysis to build upon current knowledge and increase our understanding of the roles that both polar regions play in global processes.



United States issued this two 84¢ International letter rate stamps souvenir sheet that depict typical auroral displays in both polar regions on February 21, 2007. It was only available through the USPS online website and their philately catalog.

Part 1: Covers

There are undoubtedly hundreds of IGY covers out there, so only a small percentage of them can be discussed. The approach will be to consider some typical covers in each of the following six areas of IGY interest:

1. The IGY logo;
2. Activities of the *Comité spécial de l'Année géophysique internationale* (CSAGI);
3. Upper atmospheric and rocket research in the IGY;
4. Auroral research in the IGY;
5. Solar research in the IGY; and
6. Satellites launched during the IGY.



The **IGY logo** consists of a symbolic globe and small satellite in orbit around it. The logo or variations on it is found of course on many IGY covers. This can include FDCs of IGY stamps with the logo in the cancel as shown on Japan s.637 FDC [top left], in the cachet as seen on First Day Covers of French Southern Antarctica Territory [FSAT] s.8-10 [top right], Romania s.C52a [right] and Bulgaria s.C76 [not shown], or in both the cachet and the cancel as found on a Czechoslovakia s.836-8 FDC [right].

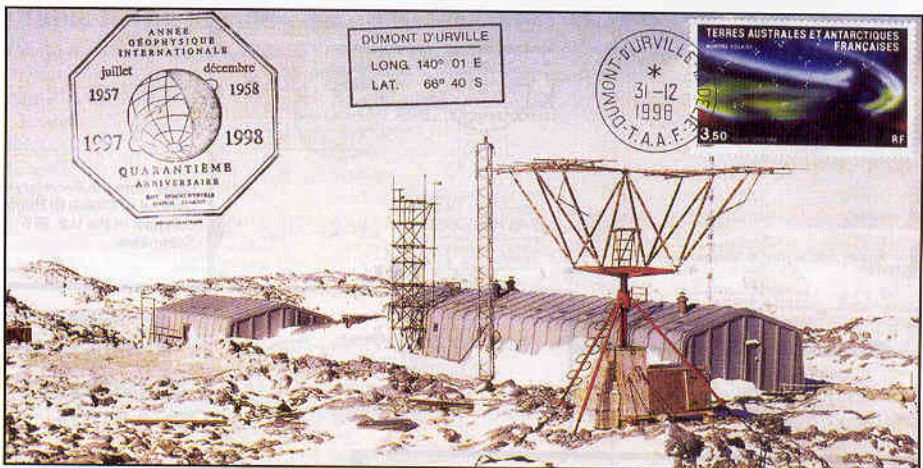
The logo is also found on some IGY postal entires, such as in the cachet on the Soviet stamped envelope issued in 1977 for the 20th anniversary of the IGY [below right], or in the printed stamp of the Soviet stamped envelope issued in 1982 for the 25th anniversary of the IGY (this item also shows Sputnik 1 in its cachet) [below left].



The **Comité spécial de l'Année géophysique internationale** (CSAGI) coordinated the IGY program activities. It met in various locations, including in Moscow from July 30 through August 9, 1958 for its Fifth Assembly. A commemorative cover issued on July 30th of that year and franked with USSR s.2089 (one of several stamps issued by the USSR for the IGY) includes the IGY logo and also cachets marking the 5th Assembly meeting. [top right]



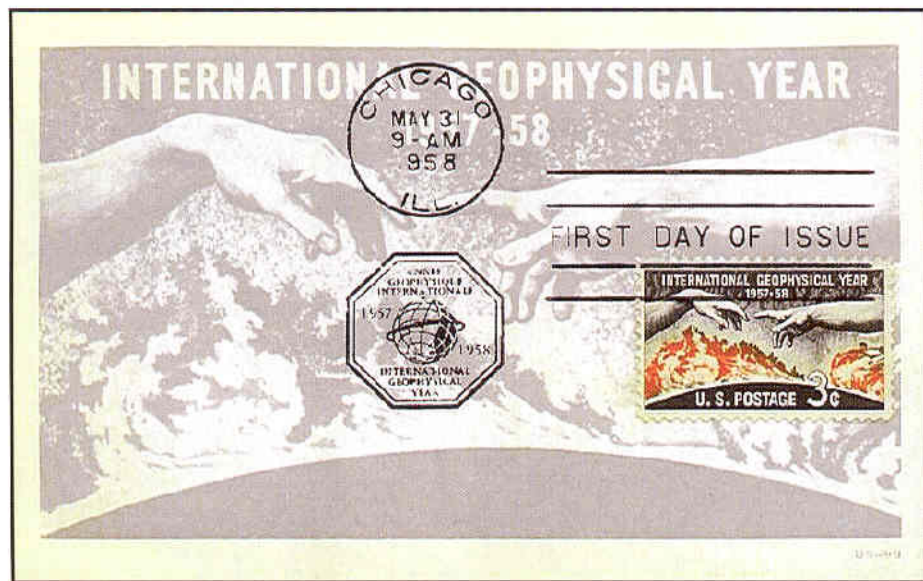
Upper atmospheric research in the IGY was often conducted by rockets, such as the one illustrated in the cancellation of another cover with Japan s.637 [middle right], this one indicating clearly that it is commemorating an IGY rocket project (the IGY logo is also found on this cover). An interesting U.S. cover with a Rocket Research Institute cinderella containing a modified IGY logo with the words "July 1 1957 Start of the International Geophysical Year" also exists. [bottom right] It was flown by rocket on that date. A beautiful cover franked with FSAT s.C80 was issued December 31, 1998 to mark the 40th anniversary of the IGY. [below] This one shows an Antarctic research station with a large antenna in the form of an open basket formed by a pair of horizontal yagi antennas, similar to the antenna found in the stamps FSAT s.8-10. [previous page] The IGY logo with text indicating the 40th anniversary of the IGY is also found on this cover.





Studies of the aurora were also part of the upper atmospheric research program of the IGY. One interesting cover in this regard is the FDC of Finland s.373-4. [top left] This set issued in 1960 was not specifically for the IGY but rather for the 12th General Assembly of the International Union of Geodesy and Geophysics in Helsinki. However, aurora are depicted on the higher-value of the two stamps, and also on the cachet of the FDC, which also refers to the IGY. Another pertinent cover comes from the auroral research program in Canada in 1957 during the IGY [bottom left]. It contained a report on the aurora from the Aviation Forecast Office at Rivers Camp, Manitoba and sent to the IGY Auroral Research Centre at the Canadian National Research Council in Ottawa.

IGY stamps with a **solar theme** include Hungary s.1217 and USA s.1107. A FDC maxicard with this latter stamp takes advantage of the design of the stamp itself to emphasize the solar theme, with the IGY logo prominently displayed in the centre of the card. [below]



Quite a few IGY covers related to **satellites launched during the IGY** do exist. Satellites launched during the IGY or soon thereafter as illustrated in IGY stamps were discussed in the first part of this article. The satellites launched during the IGY for which references have been found in IGY covers or postal entires are Sputnik-1 (launched October 4, 1957), Sputnik-2 (November 3, 1957), Explorer-1 (January 31, 1958), and Sputnik-3 (May 15, 1958).

Sputnik-1 is illustrated on the cachets of IGY covers DDR s.370 FDC and Hungary s.1262 FDC, and on the cancellation of DDR s.371-2 FDC, with four radial antennas in a single plane. It appears that such a depiction of the Sputnik 1 is incorrect. Apparently the cachet and cancellation



designers simply followed the lead of the stamp designers: DDR Scott 370 (and other stamps as outlined in Part 2) also contain the incorrect depiction. The same satellite design is also found in the cachet of Indonesia Scott 460-4 FDC, issued October 15, 1958. The satellite on that FDC closely resembles Vanguard-2, but that satellite was launched several months later, on February 17, 1959. The satellite design in the cachet of the Indonesian FDC seems to be in error as well: it represents no satellite launched in the IGY period. The correct drawing of Sputnik-1 has the swept back antennas commonly seen in its philatelic images. Such a drawing of the satellite is found on the back of a post card that was issued by the USSR in 1958. It commemorates the space dog Laika along with Sputniks-1, -2 and -3, and includes the IGY logo as well. The FDC of Bulgaria Scott C76 has a cachet with a modified IGY logo, and also a small triangular satellite in orbit that can be interpreted as Sputnik-3, since this satellite with its triangular shape is also featured on the stamp itself.



Explorer-1 is depicted in an American FDC of USA Scott 1107. It shows both the IGY logo and a clear drawing of the thin, rocket-like satellite in the cachet at the left. Another American cover franked with USA Scott 1107 and dated July 1, 1959, is inscribed "First Anniversary - IGY" although that date refers in fact to the second anniversary of the official beginning of the IGY. However, the rocket drawn in the cachet represents Jupiter-C, the rocket that launched Explorer-1 and other early American satellites of the late 1950s.



Part 2: Stamps

The IGY truly ushered mankind into the modern age of upper atmospheric and space research. This article concentrates on stamps issued for the IGY that also illustrate those themes, in various related categories.

The IGY logo itself is symbolic of the importance of the near-space environment to the IGY. It consists of a symbolic Earth seen from beneath, presumably with the South Pole visible. Some latitude and longitude lines are drawn, and part of the globe is in darkness, while the other part is illuminated. A tiny satellite is shown in a low orbit around the globe. This symbol, in various sizes and sometimes with modifications, is shown on many IGY stamps. The best depictions are found in USSR s.2235, Japan s. 637, Indonesia s.460-464, South Georgia and Sandwich s.124 and British Antarctic Territory s.141 [not shown] (the latter two were issued in 1987 as parts of sets marking the 30th anniversary of the IGY).



Ecuador s.650 and Peru s.C168 are similar, except instead of the symbolic globe logo they show drawings of the Earth in space. The Antarctic is visible in the Ecuadorian stamp, while the Peruvian stamp emphasizes the Americas. Many other stamps show the logo as a very small design element, often tucked away in a corner.



Upper atmospheric research was important during the IGY. This was done in some cases by high altitude balloons, such as the one shown in [DDR s.371](#). Such balloons probably carried (among other payload) instruments to measure cosmic rays, which were one particular area of interest during the IGY. Rockets were also used directly for high altitude research. One such rocket is found in [USSR s.1959](#), a tiny stamp whose Cyrillic inscription reads "rocket research".



Auroral studies were also carried out during the IGY, as part of the upper atmospheric research program. This is nicely illustrated in [USSR s.2089](#), which shows the aurora and a camera being used to photograph them. The aurora are also seen in IGY stamps from Hungary s.1214 and [French Southern and Antarctic Territory s.10](#). On this latter set is also depicted a large antenna in the form of an "open basket", actually a pair of horizontal yagi antennas, probably used to study the ionosphere and the propagation of radio waves.



Solar studies were important in the IGY, which was undertaken during a period of maximum sunspot activity. Such sunspots are illustrated near the solar equator in [Hungary s.1217](#). The solar theme is carried further in [USA s.1107](#), which depicts solar protuberances and flares raging from the sun's surface.



In 1954, the CSAGI had already recommended that "in view of the advanced state of present rocket techniques" consideration should be given to "the launching of small satellites, to their scientific instrumentation, and to the new problems associated with satellite experiments, such as power supply, telemetering and orientation of the vehicle (CSAGI Bulletin #4, p. 179). These ideas did come to fruition during the IGY.

Sputnik-1, the first artificial satellite to attain Earth orbit, was launched by the USSR during the IGY on 4 October 1957. Thus dawned the space age, with a small lonely sphere with four antennas moving through space in an elliptical orbit between 215 and 939 km above the surface. Sputnik-1 came to represent, symbolically, the main space-related achievement of the IGY. It transmitted data for 21 days, and decayed from orbit 4 January 1958 (in the lower parts of its orbit the upper atmosphere exerted substantial drag on it). There are probably thousands of philatelic items that depict Sputnik-1, and this includes of course some of the IGY items.

There is a fascinating dichotomy between two types of depictions of Sputnik-1 in the IGY stamps. Some of them, such as [FSAT s.C73](#) which is part of the strip [s.C75a](#), and [North Korea s.134](#) show the satellite as it is traditionally seen on almost all other Sputnik 1 items: a small sphere with four swept-back antennas.

Others, however, show the satellite with four antennas extending radially outward from the centre of the sphere in a single plane as seen [DDR s.370](#) and [Poland s.822](#). Four radial antennas are also found on the Sputnik 1 depicted on [Romania s.C49](#) and [C50](#) (those stamps do not specifically mention the IGY but were issued in November 1957 to mark the launches of Sputniks 1 and 2). The reason for the design difference is not known. Vanguard-2, launched by the US on 17 February 1958, did consist of a sphere with four radial antennas lying in one plane, similar to the satellite in the DDR, Polish and Romanian stamps. However, there would be no reason for Soviet satellite states to commemorate an American satellite on their stamps, and moreover those stamps were issued before the launch of Vanguard 1. Examination of closeup photographs of Sputnik 1 reveals that four swept-back sockets for the antennas were attached to the sphere's skin, with no obvious swiveling capability. It seems that the common swept-back depiction of Sputnik 1's antennas is the correct one. Another bit of indirect evidence also supports this conclusion: swept-back antennas would have been affected by atmospheric drag to a lesser extent than radial antennas, and so would have been preferred.



Sputnik-2, with the dog Laika aboard, was successfully launched 3 November 1957. [Czechoslovakia s.838](#), inscribed 3-XI-1957, depicts the satellite apparently still in its protective fairing, with four trailing antennas.

The successful launches of Sputniks 1 and 2 came as a shock to the USA, since they proved that the USSR had won that part of the space race. America's first attempt at a reply, Vanguard TV-3, failed on December 6, 1957. However, Explorer 1 was successfully put into orbit by the United States on February 1, 1958 (universal time). No IGY stamps are known to show Explorer 1 which made one notable discovery: the band of charged particles around the Earth that came to be known as the van Allen radiation belt.

The USA was also successful in launching Vanguard 1 on March 17, 1958. This miniature satellite, with a mass of only 1.5 kg, is depicted on two IGY stamps from [Haiti s.424](#) and [C119](#). It provided data from orbit until May 1964.

Sputnik 3 was a successful Soviet science satellite, launched May 15, 1958. It is pictured on several IGY stamps: [Bulgaria s.C76](#), [Hungary s.1218](#), and [USSR s.2083](#). With a mass of 1,327 kg, it was by far the largest satellite of the period, and it finally decayed from orbit on April 6, 1960.


The Soviet satellite Luna 1 was launched January 2, 1959, just two days after the official end of the IGY. It is seen in [Hungary s.1216](#). It was a lunar probe that passed within 6,000 kilometers of the moon before finally going into an orbit around the sun.

[USSR s.2235](#), [shown on p. 160] issued on September 16, 1959, is an IGY stamp that depicts a rocket launch. It commemorates Luna-2, launched on September 13th of that year. It hit the moon two days later, the first man-made object ever to do so. The satellite itself is not shown on the stamp. However, [Hungary s.1262](#), a modification of s.1216 mentioned in the previous paragraph, has an overprint and a different inscription: 1959.IX.13. Supposing that Luna-1 and Luna-2 were very similar in design, then other than the different inscribed dates, the satellite on Hungary s.1216 and 1262 can be thought of as depicting either Luna 1 or Luna 2.



As we have seen, the dawn of the space age coincided with the IGY, which combined traditional geophysical studies with techniques and tools for research that were completely new at the time.

The IGY took place at a special time in history; it both contributed to and benefited from the dawn of the space age, whose birth took place during the IGY period with the successful launch of Sputnik-1. The IGY continued the tradition of international collaboration in geophysical research established by the earlier International Polar Years, and as a result contributed significantly to mankind's store of knowledge about the Earth, its atmosphere and its near-space

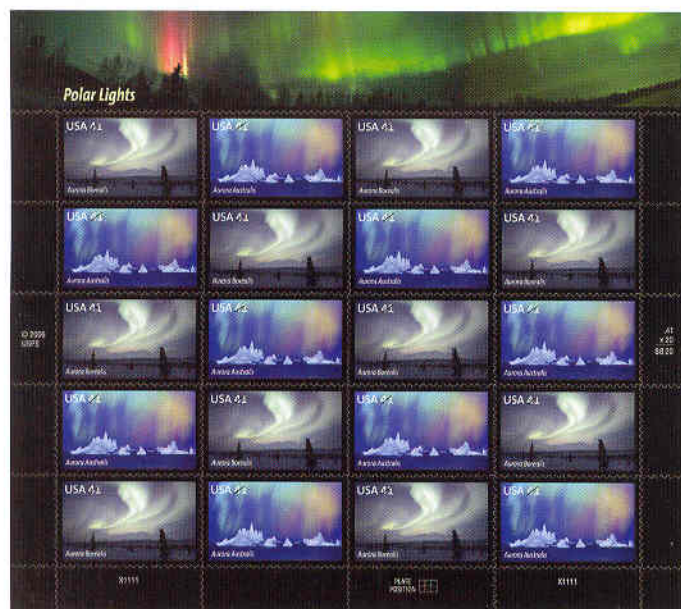
environment. Many philatelic items were issued to commemorate various aspects of the IGY. The next part of this article studies IGY stamps that treated the themes of upper atmospheric and near-space research, including artificial satellites launched during and just after the IGY. The spirit of the first and second IPYs and the IGY has lived on through other cooperative geophysical research projects. The latest of these, the fourth IPY, started on March 1, 2007. The IGY and the IPYs teach us that just as the geophysics of the Earth recognizes no political boundaries, so too must we search for scientific truth through international cooperation and the elimination of artificial barriers. 

The interested reader can find a list and images of all stamps that specifically mention the International Geophysical Year, along with many IGY covers, at the authors' web page: <http://www1.cira.colostate.edu/ramm/hillger/IGY.htm>

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The USPS issued a sheet of 41¢ first class rate stamps entitled "Polar Lights" on October 1, 2007, featuring the same images from the souvenir sheet issued in February.

The photograph of the aurora borealis was taken by Fred Hirschmann of Wasilla, Alaska. It shows the northern lights over the Talkeetna Mountains in Alaska in January 2005.

The aurora australis, a phenomenon of the southern polar region, was photographed by Per-Andre Hoffmann in the Bellinghousen Sea along the west side of the Antarctic Peninsula in March 2004.